

EXAMPLE SCENARIO 11

TABLE 4.3.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
The Dean Company

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name	
Ingestion	Resident	Adult	Soil at Site 1	CS	Chemical Concentration in Soil	See Table 3.3	mg/kg	See Table 3.3	Chronic Daily Intake (CDI) (mg/kg-day) = CS x IR x FI x EF x ED x CF1 x 1/BW x 1/AT	
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991		
				FI	Fraction Ingested	1	--	Professional Judgment		
				EF	Exposure Frequency	350	days/year	EPA, 1991		
				ED	Exposure Duration	24	years	EPA, 1991		
				CF1	Conversion Factor	1E-06	kg/mg	--		
		BW	Body Weight	70	kg	EPA, 1991				
		AT-C	Averaging Time - Cancer	25,550	days	EPA, 1989				
		AT-N	Averaging Time - Non-Cancer	8,760	days	EPA, 1989				
		CSR	Radionuclide Concentration in Soil	See Table 3.3	pCi/g	See Table 3.3	Intake (pCi) = CSR x IR x CF x EF x ED			
		IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991				
		EF	Exposure Frequency	350	days/year	EPA, 1991				
					ED	Exposure Duration	24	years	EPA, 1991	
					CF1	Conversion Factor	1.00E-03	g/mg	--	
		Child	Soil at Site 1	CS	Chemical Concentration in Soil	See Table 3.3	mg/kg	See Table 3.3	CDI (mg/kg-day) = CS x IR x FI x EF x ED x CF1 x 1/BW x 1/AT	
	IR-S			Ingestion Rate of Soil	200	mg/day	EPA, 1991			
	FI			Fraction Ingested	1	--	Professional Judgment			
	EF			Exposure Frequency	350	days/year	EPA, 1991			
ED	Exposure Duration			6	years	EPA, 1991				
CF1	Conversion Factor			1E-06	kg/mg	--				
BW	Body Weight	15	kg	EPA, 1991						
AT-C	Averaging Time - Cancer	25,550	days	EPA, 1989						
AT-N	Averaging Time - Non-Cancer	2,190	days	EPA, 1989						

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Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name			
Ingestion (continued)	Resident (continued)	Child (continued)	Soil at Site 1 (continued)	CSR	Radionuclide Concentration in Soil	See Table 3.3	pCi/g	See Table 3.3	Intake (pCi) = CSR x IR x CF x EF X ED			
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 1991				
				EF	Exposure Frequency	350	days/year	EPA, 1991				
				ED	Exposure Duration	6	years	EPA, 1991				
				CF1	Conversion Factor	1.00E-03	g/mg	--				
Dermal	Resident	Adult	Soil at Site 1	CS	Chemical Concentration in Soil	See Table 3.3	mg/kg	See Table 3.3	Dermal Absorbed Dose (DAD) (mg/kg-day) = DA-event x EF x ED x EV x SA X 1/BW x 1/AT where Absorbed Dose per Event (DA-event) (mg/cm2-event) = CS x CF x AF x ABS-d			
				CF	Conversion Factor	1E-06	kg/mg	--				
				SA	Skin Surface Area Available for Contact	5,700	cm2	EPA, 2001				
				AF	Soil to Skin Adherence Factor	0.07	mg/cm2-event	EPA, 2001				
				ABS-d	Dermal Absorption Factor	chemical-specific	unitless	EPA, 2001				
				EV	Event Frequency	1	events/day	EPA, 2001				
				EF	Exposure Frequency	350	days/year	EPA, 2001				
				ED	Exposure Duration	24	years	EPA, 1991				
				BW	Body Weight	70	kg	EPA, 2001				
				AT-C	Averaging Time - Cancer	25,550	days	EPA, 2001				
				AT-N	Averaging Time - Non-Cancer	8,760	days	EPA, 2001				
				Child	Soil at Site 1	CS	Chemical Concentration in Soil	See Table 3.3		mg/kg	See Table 3.3	DAD (mg/kg-day) = DA-event x EF x ED x EV x SA X 1/BW x 1/AT where DA-event (mg/cm2-event) = CS x CF x AF x ABS-d
						CF	Conversion Factor	1E-06		kg/mg	--	
	SA	Skin Surface Area Available for Contact	2,800			cm2	EPA, 2001					
	AF	Soil to Skin Adherence Factor	0.2			mg/cm2-event	EPA, 2001					
	ABS-d	Dermal Absorption Factor	chemical-specific			unitless	EPA, 2001					
	EV	Event Frequency	1			events/day	EPA, 2001					
	EF	Exposure Frequency	350	days/year	EPA, 2001							
	ED	Exposure Duration	6	years	EPA, 2001							
BW	Body Weight	15	kg	EPA, 2001								
AT-C	Averaging Time - Cancer	25,550	days	EPA, 2001								
AT-N	Averaging Time - Non-Cancer	2,190	days	EPA, 2001								

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Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name	
External (Radiation)	Resident	Adult	Soil at Site 1	CSR	Radionuclide Concentration in Soil	See Table 3.3	pCi/g	See Table 3.3	$\text{External Exposure (pCi-year/g)} = \text{CSR} \times \text{ET} \times \text{EF} \times ((\text{Fi} \times \text{GSFi}) + (\text{Fo} \times \text{GSFo})) \times \text{ED} \times \text{CF}$	
				ET	Exposure Time	17	hrs/day	EPA, 1991		
				EF	Exposure Frequency	350	days/year			
				Fi	Time Fraction Indoors	0.75	--			
				Fo	Time Fraction Outdoors	0.25	--			
				GSFi	Gamma Shielding Factor Indoors	0.8	--			
				GSFo	Gamma Shielding Factor Outdoors	1	--			
		ED	Exposure Duration	24	years	EPA, 1991				
		CF	Conversion Factor	0.000114	years/hr	--				
		Child	Soil at Site 1	CSR	Radionuclide Concentration in Soil	See Table 3.3	pCi/g	See Table 3.3		$\text{External Exposure (pCi-year/g)} = \text{CSR} \times \text{ET} \times \text{EF} \times ((\text{Fi} \times \text{GSFi}) + (\text{Fo} \times \text{GSFo})) \times \text{ED} \times \text{CF}$
				ET	Exposure Time	17	hrs/day	EPA, 1991		
				EF	Exposure Frequency	350	days/year			
				Fi	Time Fraction Indoors	0.875	--			
				Fo	Time Fraction Outdoors	0.125	--			
GSFi	Gamma Shielding Factor Indoors			0.8	--					
GSFo	Gamma Shielding Factor Outdoors			1	--					
ED	Exposure Duration	6	years	EPA, 1991						
CF	Conversion Factor	0.000114	years/hr	--						

EPA 1989: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual, Part A. OERR EPA/540/1-89/002.

EPA 1991: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER 9285.6-03.

EPA 1995: Assessing Dermal Exposure from Soil, Technical Guidance Manual, Region III, EPA/903-K-95-003.

EPA 1997: Exposure Factors Handbook, Volume 1. EPA/600/P-95/002Fa.

EPA 2001: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim.

NA = Not Available